

WHAT IS CLAIMED IS:

1 1. A method for monitoring depletion of a consumable resource in a
2 monitored system, comprising:
3 receiving information on at least one unit of work to be processed by the
4 monitored system, wherein the monitored system would deplete the consumable resource
5 when processing each unit of work;
6 determining a rate of resource depletion per unit of work processed;
7 estimating an amount of resource remaining after the monitored system processes
8 the at least one unit of work, wherein the estimate is a function of the determined rate of
9 resource depletion and a number of the one or more units of work to process; and
10 generating a graphical element for display on a computer monitor indicating the
11 estimated amount of the resource remaining.

1 2. The method of claim 1, wherein the graphical display comprises a
2 graphical gauge displaying a range of values from zero to a maximum capacity of the
3 consumable resource in the monitored system, wherein the estimated amount of the
4 resource remaining is indicated on the gauge.

1 3. The method of claim 2, wherein indicating the estimated amount of the
2 resource remaining on the gauge comprises displaying a graphical needle on the gauge
3 pointing to a position on the gauge indicating the estimated amount of the resource
4 remaining.

1 4. The method of claim 1, further comprising:
2 estimating a number of units of work that can be processed with the estimated
3 amount of the resource remaining; and
4 generating information to display with the generated graphical element indicating
5 the estimated number of units of work.

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4 monitored system indicating the estimated amount of the resource remaining for the
5 monitored system.

1 9. A method for monitoring depletion of a consumable resource in a printer,
2 comprising:
3 receiving a print job having print matter for at least one page;
4 determining a rate of resource depletion per page;
5 estimating an amount of resource remaining after the printer processes the print
6 job as a function of a number of the at least one page in the print job and the determined
7 rate of resource depletion; and
8 generating a graphical element for display on a computer monitor indicating the
9 estimated amount of the resource remaining.

1 10. The method of claim 9, further comprising:
2 providing a data structure indicating one rate of resource depletion for different
3 printers; and
4 determining an identifier of the printer to print the print job, wherein determining
5 the rate of resource depletion comprises determining the rate of resource depletion in the
6 data structure corresponding to the determined identifier of the printer.

1 11. The method of claim 10, wherein the identifier of the printer comprises
2 one of a printer model and a unique name of the printer that will process the print job.

1 12. The method of claim 10, wherein the data structure provides rate of
2 resource depletions for different material compositions used for the consumable resource,
3 wherein determining the rate of resource depletion further comprises:
4 determining a material composition of the consumable resource in the printer; and

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5 determining the rate of resource depletion in the data structure for the determined
6 material composition.

1 13. The method of claim 9, further comprising:
2 receiving notification from the printer that the consumable resource is depleted in
3 the monitored printer; and
4 determining an adjustment factor if the estimated amount of resource remaining is
5 not estimated to be depleted, wherein the adjustment factor is applied when estimating
6 the amount of resource remaining during use of the monitored printer after the
7 consumable resource is replenished in the printer.

1 14. The method of claim 9, further comprising:
2 after the consumable resource is fully replenished, initializing the amount of
3 resource remaining to full capacity, wherein estimating the amount of resource remaining
4 comprises:

5 (i) multiplying the number of pages in the print job times the determined
6 rate of resource depletion to estimate an amount of resource depletion from at the
7 printer when processing the print job; and
8 (ii) setting the estimated amount of resource remaining to the estimated
9 amount of resource remaining minus the estimated amount of resource depletion.

1 15. The method of claim 9, further comprising:
2 determining whether the estimated amount of the resource remaining indicates
3 that the consumable resource is depleted in the monitored printer; and
4 generating a message indicating that there is not a sufficient amount of the
5 resource remaining to process the number of pages in the print job if the resource is
6 determined to be depleted in the monitored system.

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1 16. The method of claim 9, further comprising:
2 determining at least one attribute of the print job; and
3 determining one attribute factor for each determined attribute of the print job,
4 wherein the determined at least one attribute factor is used to estimate the amount of the
5 resource remaining.

1 17. The method of claim 16, wherein the consumable resource comprises
2 toner and wherein the determined attributes of the print job include contrast and boldness.

1 18. The method of claim 17, further comprising:
2 providing a contrast table and boldness table providing different contrast and
3 boldness factors, respectively, for different contrast and boldness settings.

1 19. The method of claim 9, wherein the graphical display comprises a
2 graphical gauge displaying a range of values from zero to a maximum capacity of the
3 consumable resource in the monitored system, wherein the estimated amount of the
4 consumable resource remaining is indicated on the gauge.

1 20. The method of claim 19, wherein the printer is a color printer, and wherein
2 resource depletion is monitored for multiple color toners used in the monitored printer,
3 wherein one gauge is displayed for each color toner in the printer

1 21. The method of claim 19, wherein the consumable resource is monitored at
2 multiple printers and the amount of resource remaining is estimated for each monitored
3 printer, further comprising displaying one graphical gauge indicating the estimated
4 amount of the resource remaining for each monitored printer.

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1 22. The method of claim 9, further comprising:
2 estimating a number of pages that can be processed with the estimated amount of
3 the resource remaining; and
4 generating information to display with the generated graphical element indicating
5 the estimated number of pages.

1 23. The method of claim 9, wherein the monitored consumable resource is one
2 of toner and fuser oil.

1 24. A system for monitoring depletion of a consumable resource, comprising:
2 (a) a monitored system that uses the consumable resource; and
3 (b) a computer monitor; and
4 (c) a processing unit in communication with the monitored system and the
5 computer monitor, including:
6 (i) means for receiving information on at least one unit of work to be
7 processed by the monitored system, wherein the monitored system would deplete
8 the consumable resource when processing each unit of work;
9 (ii) means for determining a rate of resource depletion per unit of work
10 processed;
11 (iii) means for estimating an amount of resource remaining after the
12 monitored system processes the at least one unit of work, wherein the estimate is
13 a function of the determined rate of resource depletion and a number of the one or
14 more units of work to process; and
15 (iv) means for generating a graphical element for display on the computer
16 monitor indicating the estimated amount of the resource remaining.

1 25. The system of claim 24, wherein the graphical display comprises a
2 graphical gauge displaying a range of values from zero to a maximum capacity of the

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3 consumable resource in the monitored system, wherein the estimated amount of the
4 resource remaining is indicated on the gauge.

1 26. The system of claim 24, wherein the processing unit further includes:
2 means for receiving notification that the consumable resource is depleted in the
3 monitored system; and
4 means for determining an adjustment factor if the estimated amount of resource
5 remaining is not estimated to be depleted, wherein the adjustment factor is applied when
6 estimating the amount of resource remaining during use of the monitored system after the
7 consumable resource is replenished in the monitored system.

1 27. The system of claim 24, further comprising:
2 multiple systems using the consumable resource;
3 wherein the processing unit is in communication with the multiple systems, and
4 wherein the processing unit further includes:
5 (i) means for monitoring the multiple systems;
6 (ii) means for determining the estimated amount of resource remaining for
7 each monitored system; and
8 (iii) means for displaying at least one graphical element on the computer
9 monitor for each monitored system indicating the estimated amount of the
10 resource remaining for the monitored system.

1 28. A system for monitoring depletion of a consumable resource, comprising:
2 (a) a printer; and
3 (c) a computer monitor; and
4 (b) a processing unit in communication with the printer and the computer monitor,
5 comprising:

- 6 (i) means for receiving a print job having print matter for at least one
7 page;
8 determining a rate of resource depletion per page;
9 (ii) means for estimating an amount of resource remaining after the printer
10 processes the print job as a function of a number of the at least one page in the
11 print job and the determined rate of resource depletion; and
12 (iii) means for generating a graphical element for display on a computer
13 monitor indicating the estimated amount of the resource remaining.

1 29. The system of claim 28, wherein the processing unit further comprises:
2 means for providing a data structure indicating one rate of resource depletion for
3 different printers; and
4 means for determining an identifier of the printer to print the print job, wherein
5 determining the rate of resource depletion comprises determining the rate of resource
6 depletion in the data structure corresponding to the determined identifier of the printer.

1 30. The system of claim 28, wherein the data structure provides rate of
2 resource depletions for different material compositions used for the consumable resource,
3 wherein the means for determining the rate of resource depletion further performs:
4 determining a material composition of the consumable resource in the printer; and
5 determining the rate of resource depletion in the data structure for the determined
6 material composition.

1 31. The system of claim 28, wherein the processing unit further comprises:
2 means for receiving notification from the printer that the consumable resource is
3 depleted in the monitored printer; and
4 means for determining an adjustment factor if the estimated amount of resource
5 remaining is not estimated to be depleted, wherein the adjustment factor is applied when

6 estimating the amount of resource remaining during use of the monitored printer after the
7 consumable resource is replenished in the printer.

1 32. The system of claim 28, wherein the processing unit further includes:
2 means for determining at least one attribute of the print job; and
3 means for determining one attribute factor for each determined attribute of the
4 print job, wherein the determined at least one attribute factor is used to estimate the
5 amount of the resource remaining.

1 33. The system of claim 28, wherein the graphical display comprises a
2 graphical gauge displaying a range of values from zero to a maximum capacity of the
3 consumable resource in the monitored system, wherein the estimated amount of the
4 consumable resource remaining is indicated on the gauge.

1 34. The system of claim 33, wherein the printer is a color printer, and wherein
2 resource depletion is monitored for multiple color toners used in the monitored printer,
3 wherein one gauge is displayed for each color toner in the printer

1 35. The method of claim 33, wherein the consumable resource is monitored at
2 multiple printers and the amount of resource remaining is estimated for each monitored
3 printer, further comprising displaying one graphical gauge indicating the estimated
4 amount of the resource remaining for each monitored printer.

1 36. An article of manufacture including code method for monitoring depletion
2 of a consumable resource in a monitored system and displaying information on a
3 computer monitor, wherein the code causes operations to be performed comprising:

4 receiving information on at least one unit of work to be processed by the
5 monitored system, wherein the monitored system would deplete the consumable resource
6 when processing each unit of work;
7 determining a rate of resource depletion per unit of work processed;
8 estimating an amount of resource remaining after the monitored system processes
9 the at least one unit of work, wherein the estimate is a function of the determined rate of
10 resource depletion and a number of the one or more units of work to process; and
11 generating a graphical element for display on the computer monitor indicating the
12 estimated amount of the resource remaining.

1 37. The article of manufacture of claim 36, wherein the graphical display
2 comprises a graphical gauge displaying a range of values from zero to a maximum
3 capacity of the consumable resource in the monitored system, wherein the estimated
4 amount of the resource remaining is indicated on the gauge.

1 38. The article of manufacture of claim 38, wherein indicating the estimated
2 amount of the resource remaining on the gauge comprises displaying a graphical needle
3 on the gauge pointing to a position on the gauge indicating the estimated amount of the
4 resource remaining.

1 39. The article of manufacture of claim 36, further comprising:
2 estimating a number of units of work that can be processed with the estimated
3 amount of the resource remaining; and
4 generating information to display with the generated graphical element indicating
5 the estimated number of units of work.

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1 40. The article of manufacture of claim 36, further comprising:
2 receiving notification that the consumable resource is depleted in the monitored
3 system; and
4 determining an adjustment factor if the estimated amount of resource remaining is
5 not estimated to be depleted, wherein the adjustment factor is applied when estimating
6 the amount of resource remaining during use of the monitored system after the
7 consumable resource is replenished in the monitored system.

1 41. The article of manufacture of claim 36, further comprising:
2 after the consumable resource is fully replenished, initializing the estimated
3 amount of resource remaining to full capacity, wherein estimating the amount of resource
4 remaining comprises:
5 (i) multiplying the number of one or more units of work to process times
6 the rate of resource depletion to estimate an amount of resource depletion that
7 results from processing the at least one unit of work; and
8 (ii) setting the estimated amount of resource remaining to the estimated
9 amount of resource remaining minus the estimated amount of resource depletion.

1 42. The article of manufacture of claim 36, further comprising:
2 determining whether the estimated amount of the resource remaining indicates
3 that the consumable resource is depleted in the monitored system; and
4 generating a message indicating that there is not a sufficient amount of resource
5 remaining to process the at least one unit of work if the resource is determined to be
6 depleted in the monitored system.

1 43. The article of manufacture of claim 36, wherein multiple systems are
2 monitored, wherein the estimated amount of resource remaining is determined for each
3 monitored system, and at least one graphical element is displayed on the computer

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4 monitor for each monitored system indicating the estimated amount of the resource
5 remaining for the monitored system.

1 44 An article of manufacture including code for monitoring depletion of a
2 consumable resource in a printer, wherein the code causes operations to be performed
3 comprising:
4 receiving a print job having print matter for at least one page;
5 determining a rate of resource depletion per page;
6 estimating an amount of resource remaining after the printer processes the print
7 job as a function of a number of the at least one page in the print job and the determined
8 rate of resource depletion; and
9 generating a graphical element for display on a computer monitor indicating the
10 estimated amount of the resource remaining.

1 45. The article of manufacture of claim 44, further comprising:
2 providing a data structure indicating one rate of resource depletion for different
3 printers; and
4 determining an identifier of the printer to print the print job, wherein determining
5 the rate of resource depletion comprises determining the rate of resource depletion in the
6 data structure corresponding to the determined identifier of the printer.

1 46. The article of manufacture of claim 45, wherein the identifier of the
2 printer comprises one of a printer model and a unique name of the printer that will
3 process the print job.

1 47. The article of manufacture of claim 45, wherein the data structure
2 provides rate of resource depletions for different material compositions used for the

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3 consumable resource, wherein determining the rate of resource depletion further
4 comprises:
5 determining a material composition of the consumable resource in the printer; and
6 determining the rate of resource depletion in the data structure for the determined
7 material composition.

1 48. The article of manufacture of claim 44, further comprising:
2 receiving notification from the printer that the consumable resource is depleted in
3 the monitored printer; and
4 determining an adjustment factor if the estimated amount of resource remaining is
5 not estimated to be depleted, wherein the adjustment factor is applied when estimating
6 the amount of resource remaining during use of the monitored printer after the
7 consumable resource is replenished in the printer.

1 49. The article of manufacture of claim 44, further comprising:
2 after the consumable resource is fully replenished, initializing the amount of
3 resource remaining to full capacity, wherein estimating the amount of resource remaining
4 comprises:
5 (i) multiplying the number of pages in the print job times the determined
6 rate of resource depletion to estimate an amount of resource depletion from at the
7 printer when processing the print job; and
8 (ii) setting the estimated amount of resource remaining to the estimated
9 amount of resource remaining minus the estimated amount of resource depletion.

1 50. The article of manufacture of claim 44, further comprising:
2 determining whether the estimated amount of the resource remaining indicates
3 that the consumable resource is depleted in the monitored printer; and

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1 55. The method of claim 54, wherein the printer is a color printer, and wherein
2 resource depletion is monitored for multiple color toners used in the monitored printer,
3 wherein one gauge is displayed for each color toner in the printer

1 56. The article of manufacture of claim 54, wherein the consumable resource
2 is monitored at multiple printers and the amount of resource remaining is estimated for
3 each monitored printer, further comprising displaying one graphical gauge indicating the
4 estimated amount of the resource remaining for each monitored printer.

1 57. The article of manufacture of claim 44, further comprising:
2 estimating a number of pages that can be processed with the estimated amount of
3 the resource remaining; and
4 generating information to display with the generated graphical element indicating
5 the estimated number of pages.

1 58. The article of manufacture of claim 44, wherein the monitored
2 consumable resource is one of toner and fuser oil.

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